

RECEIVED

MAR 04 2003

TECH CENTER 1600,290



1600

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003

TIME: 10:31:45

Input Set : A:\104107.01.txt

Output Set: N:\CRF4\02272003\I645337A.raw

```

3 <110> APPLICANT: Wu, Keqiang
4      Miki, Brian L
5      Tian, Lining
6      Brown, Dan
8 <120> TITLE OF INVENTION: Repressing Gene Expression in Plants
10 <130> FILE REFERENCE: 104107.1
12 <140> CURRENT APPLICATION NUMBER: US 09/645,337A
13 <141> CURRENT FILING DATE: 2000-08-25
15 <150> PRIOR APPLICATION NUMBER: US 09/383,971
16 <151> PRIOR FILING DATE: 1999-08-27
18 <160> NUMBER OF SEQ ID NOS: 14
20 <170> SOFTWARE: PatentIn version 3.2
22 <210> SEQ ID NO: 1
23 <211> LENGTH: 1807
24 <212> TYPE: DNA
25 <213> ORGANISM: Arabidopsis thaliana
27 <400> SEQUENCE: 1
28 agagagcagc tcccttcccc tcggcgagga ggaaggaaga agaaagccag agagagagag      60
30 agagatcacc gcagctcttc ctccgaccat ttgactggga ctgtgattac aacacaccgt      120
32 tgatcctacg aaaaagaggt aatggatact ggcggaatt cgttggcgct cggacctgat      180
34 ggtgtgaaga ggaagattt ttatttctat gaccttgagg tgggaatta ctactatggc      240
36 caaggtcacc ccatgaagcc ccatacgcat cgcataccac atgacctcct cgcatactac      300
38 ggtctccttc agcataatga ggttctcaag ccccttccctg ccgcggaacg tgatctctgc      360
40 cgtttccacg ccgagcacta tgtctcttt ctccgcagca ttacccctga aacccagcaa      420
42 gatcagattc gccaaactta ggccttcaat gttggtgaag actgtccctg ctltgacggc      480
44 ctltattcct ttgcccagac ctatgctgga ggaatctgtg gtggctctgt caagcttaac      540
46 cagggcctct ggcataatgc catcaactgg gctgggtggt tccatcacgc taagaagtcg      600
48 gaggcctctg gcttctgita cgtcaatgat atcgtcttag ctactctaga gctccttaag      660
50 cagcatgagc gtgttcttta tctcgaatgt gatctccacc acgggggatg agtgaggag      720
52 gcatcttatg ctactgacag ggttatgact gctcgttgc aaaaatttgc tgaattactt      780
54 cgcgttatag gtcacattca agatataagg tatggttagc gaaagtacta ttctctcaat      840
56 gtaccactgg atgatggaat cgaatgag agctatcacc tgttatcaca gcccatcatg      900
58 gggaaaagtta tggaaatttt ccgaaccagg gctgtggtat tgcgaatggg tgcctgaactcc      960
60 ctatctgggg atcgggttagg ttcttccaat ctctcaatca aagggtcatgc tgagtgcgtc      1020
62 aaattttatg gatcgttcaa tgttccctca tctgctcttg gttgtgggtg ttacactatc      1080
64 cgaatgtgtg cccgttctct gtgtacagag actggagtgc cacttggagt tgaagttgaa      1140
66 gacaagatgc cggagcagga atattatcaa tactttggtc cagactarac acttcaagtt      1200
68 gctcgaagta aatgggaaga taagaattct cgtcagatgc ttgaagagat tggcaatgac      1260
70 ctctctgaca atctctctaa gcttcaagcat cctcgaattg taactattca ggaagagaca      1320
72 ctgataaagc agattctaga ggttgatgaa gctcgaagaa ctatgggataa aagatgggat      1380
74 cctaatcagc aatctaatgt tgaatgagc cgtcgaagaa tctcgaagcag agtcaatgga      1440
76 aatctctctc aatctctctc aatctctctc aatctctctc aatctctctc aatctctctc      1500
78 aatctctctc aatctctctc aatctctctc aatctctctc aatctctctc aatctctctc      1560

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003

TIME: 10:31:48

Input Set : A:\104107.01.txt

Output Set: N:\CRF4\02272003\I645337A.raw

```

80 gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg 1623
81 gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg 1630
84 gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg 1746
86 gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg gggggggggg 1800
88 gggggggg 1807
91 <210> SEQ ID NO: 2
92 <211> LENGTH: 501
93 <212> TYPE: PRT
94 <213> ORGANISM: Arabidopsis thaliana
96 <400> SEQUENCE: 2
98 Met Asp Thr Gly Gly Asn Ser Leu Ala Ser Gly Pro Asp Gly Val Lys
99 1 5 10 15
102 Arg Lys Val Cys Tyr Phe Tyr Asp Pro Glu Val Gly Asn Tyr Tyr Tyr
103 20 25 30
106 Gly Gln Gly His Pro Met Lys Pro His Arg Ile Arg Met Thr His Ala
107 35 40 45
110 Leu Leu Ala His Tyr Gly Leu Leu Gln His Met Gln Val Leu Lys Pro
111 50 55 60
114 Phe Pro Ala Arg Glu Arg Asp Leu Cys Arg Phe His Ala Asp Asp Tyr
115 65 70 75 80
118 Val Ser Phe Leu Arg Ser Ile Thr Pro Glu Thr Gln Gln Asp Gln Ile
119 85 90 95
122 Arg Gln Leu Lys Arg Phe Asn Val Gly Glu Asp Cys Pro Val Phe Asp
123 100 105 110
126 Gly Leu Tyr Ser Phe Cys Gln Thr Tyr Ala Gly Gly Ser Val Gly Gly
127 115 120 125
130 Ser Val Lys Leu Asn His Gly Leu Cys Asp Ile Ala Ile Asn Trp Ala
131 130 135 140
134 Gly Gly Leu His His Ala Lys Lys Cys Glu Ala Ser Gly Phe Cys Tyr
135 145 150 155 160
138 Val Asn Asp Ile Val Leu Ala Ile Leu Glu Leu Leu Lys Gln His Glu
139 165 170 175
142 Arg Val Leu Tyr Val Asp Ile Asp Ile His His Gly Asp Gly Val Glu
143 180 185 190
146 Glu Ala Phe Tyr Ala Thr Asp Arg Val Met Thr Val Ser Phe His Lys
147 195 200 205
150 Phe Gly Asp Tyr Phe Pro Gly Thr Gly His Ile Gln Asp Ile Gly Tyr
151 210 215 220
154 Gly Ser Gly Lys Tyr Tyr Ser Leu Asn Val Pro Leu Asp Asp Gly Ile
155 225 230 235 240
158 Asp Asp Glu Ser Tyr His Leu Leu Phe Lys Pro Ile Met Gly Lys Val
159 245 250 255
162 Met Glu Ile Phe Arg Pro Gly Ala Val Val Leu Gln Cys Gly Ala Asp
163 260 265 270
166 Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn Leu Ser Ile Lys Gly
167 275 280 285
170 His Ala Glu Cys Val Lys Phe Met Arg Ser Phe Asn Val Pro Leu Leu
171 290 295 300
174 Leu Leu Gly Gly Gly Gly Tyr Thr Ile Arg Asn Val Ala Arg Cys Trp

```

RAW SEQUENCE LISTING

DATE: 02/27/2003

PATENT APPLICATION: US/09/645,337A

TIME: 10:31:45

Input Set : A:\104107.01.txt

Output Set : N:\CRF4\02272003\I645337A.raw

```

171 305          310          315          320
178 Cys Tyr Glu Thr Gly Val Ala Leu Gly Val Gln Val Glu Asp Lys Met
179          325          330          335
182 Pro Glu His Glu Tyr Tyr Glu Tyr Phe Gly Pro Asp Tyr Thr Leu His
183          340          345          350
186 Val Ala Pro Ser Asn Met Glu Asn Lys Asn Ser Arg Gln Met Leu Glu
187          355          360          365
190 Glu Ile Arg Asn Asp Leu Leu His Asn Leu Ser Lys Leu Gln His Ala
191          370          375          380
194 Pro Ser Val Pro Phe Gln Glu Arg Pro Pro Asp Thr Glu Thr Pro Glu
195 385          390          395          400
198 Val Asp Glu Asp Gln Glu Asp Gly Asp Lys Arg Trp Asp Pro Asp Ser
199          405          410          415
202 Asp Met Asp Val Asp Asp Asp Arg Lys Pro Ile Pro Ser Arg Val Lys
203          420          425          430
206 Arg Glu Ala Val Glu Pro Asp Thr Lys Asp Lys Asp Gly Leu Lys Gly
207          435          440          445
210 Ile Met Glu Arg Gly Lys Gly Cys Glu Val Glu Val Asp Glu Ser Gly
211          450          455          460
214 Ser Thr Lys Val Thr Gly Val Asn Pro Val Gly Val Glu Glu Ala Ser
215 465          470          475          480
218 Val Lys Met Glu Glu Gly Thr Asn Lys Gly Gly Ala Glu Gln Ala
219          485          490          495
222 Phe Pro Pro Lys Thr
223          500

```

226 <210> SEQ ID NO: 3

227 <211> LENGTH: 1800

228 <212> TYPE: DNA

229 <213> ORGANISM: Arabidopsis thaliana

232 <220> FEATURE:

233 <221> NAME/KEY: misc_feature

234 <222> LOCATION: (1374)..(1374)

235 <223> OTHER INFORMATION: "n" is a or g or c or t

237 <400> SEQUENCE: 3

```

238 gtccccacaa ctccatagtaa tgaattcttc aggcattggt gaacacaaatt ttgctctgag      60
240 taaaacttgg qaatagagag agactctgag tgagagagag attctgagtg agagacggag      120
242 atggaggcag acgaaagcgg catctctctg ccgtcggggac ccgacggacg taagcggcga      180
244 gtcagttact tctacgagcc gaagatcaga gactactact acggtcaagg ccacccgatg      240
246 aagcctcaac ggatccgtat ggtccatagc ctaatcattt actatcaact ccaccgtcgc      300
248 ttgaaataca gtgcacctag cctcgtctgac gctcccgata tcggccgatt ccatteggcg      360
250 gagtatgttg acttccctgc ttccgtttcg ccggaatcta tgggcgatalc ttccgtctga      420
252 cgaaacctaa ggcgattcaa tgcgggtgag gatgttcctg ctccgacgg actttttgat      480
254 ttttgccttg ctccgcggcg aggttctatt ggtgtctgac tcaaaattaa cagacaggac      540
256 gctgatatcg ctatcaattg gggcgggtgg ctccaccatg ctacgaaaaa cgaggcttct      600
258 ggggttttgc atgtaaacga catcgttcta gggattcttg agttgtctca gatgtttaag      660
260 cgggtttctc acatadacat tgaatgtcac catggagatg gattggaaag agtgttttac      720
262 aacactgata gatttatgac tgaattcttg caaaaatttg gggacttttt ccagggaact      780
264 ggtcaacataa gaggatgttg cgttgaaaaa gggaaatatt atgtctaaa tgttccacaa      840
266 aacgatggtt tpaacatga aatttctcgc agttgtttta gactctctat caagaaggtt      900

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003

TIME: 10:31:45

Input File : A:\104107.01.txt

Output File: N:\CRF4\02272003\I645337A.raw

```

268 atggaagt at atgacacaga agcagtttgtt cttaagttgtt gttgtgaatt cttaagttgtt 900
270 gacgggtttga attgttttaa cttaagttgtt aaggtttcaag ctgatttgcct tggattttta 1000
272 agatctttaa agttttctt cttaagttgtt gttgtttgaag gttattttat tttttttttt 1080
274 gctgtttgtt atgtttttga gttgtgaatt gttgtttgag tttgtttgga cttaagttgtt 1140
276 cttaagttgtt atgtttttga gttgtttgga cttaagttgtt gttgtttgag cttaagttgtt 1200
278 cttaagttgtt atgtttttga gttgtttgga cttaagttgtt gttgtttgag cttaagttgtt 1260
280 caacttttgg gactaataga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1320
W--> 282 cgagtttttg acgagccgga agatgacatg gagacaagac caaacctcg catntggagt 1380
284 ggaacttggg cttaagttgtt agacattgag gttgtttgga gttgtttgga gttgtttgga 1440
286 tttgtttggt gttgtttgga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1500
288 aacccagagg caagacgtgaa tttgtttgga tttgtttgga gttgtttgga gttgtttgga 1560
290 tttgtttgga tttgtttgga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1620
292 tttgtttgga tttgtttgga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1680
294 caacttgaat gttgtttgga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1740
296 aaaaaaaagg gttgtttgga gttgtttgga gttgtttgga gttgtttgga gttgtttgga 1800
299 <210> SEQ ID NO: 4
300 <211> LENGTH: 471
301 <212> TYPE: PRP
302 <213> ORGANISM: Arabidopsis thaliana
305 <220> FEATURE:
306 <221> NAME/KEY: MISC FEATURE
307 <222> LOCATION: (418)..(418)
308 <223> OTHER INFORMATION: "Xaa" is any amino acid
310 <400> SEQUENCE: 4
312 Met Glu Ala Asp Glu Ser Gly Ile Ser Leu Pro Ser Gly Pro Asp Gly
313 1 5 10 15
316 Arg Lys Arg Arg Val Ser Tyr Phe Tyr Glu Pro Thr Ile Gly Asp Tyr
317 20 25 30
320 Tyr Tyr Gly Gln Gly His Pro Met Lys Pro His Arg Ile Arg Met Ala
321 35 40 45
324 His Ser Leu Ile Ile His Tyr His Leu His Arg Arg Leu Glu Ile Ser
325 50 55 60
328 Arg Pro Ser Leu Ala Asp Ala Ser Asp Ile Gly Arg Phe His Ser Pro
329 65 70 75 80
332 Glu Tyr Val Asp Phe Leu Ala Ser Val Ser Pro Glu Ser Met Gly Asp
333 85 90 95
336 Pro Ser Ala Ala Arg Asn Leu Arg Arg Phe Asn Val Gly Glu Asp Cys
337 100 105 110
340 Pro Val Phe Asp Gly Leu Phe Asp Phe Cys Arg Ala Ser Ala Gly Gly
341 115 120 125
344 Ser Ile Gly Ala Ala Val Lys Leu Asn Arg Gln Asp Ala Asp Ile Ala
345 130 135 140
348 Ile Asn Trp Gly Gly Gly Leu His His Ala Lys Lys Ser Glu Ala Ser
349 145 150 155 160
352 Gly Phe Cys Tyr Val Asn Asp Ile Val Leu Gly Ile Leu Glu Leu Leu
353 165 170 175
356 Lys Met Phe Lys Arg Val Leu Tyr Ile Asp Ile Asp Val His His Gly
357 180 185 190
360 Asp Gly Val Glu Glu Ala Ile Tyr Thr Thr Asp Arg Val Met Thr Val

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003

TIME: 10:31:45

Input Set : A:\104107.01.txt

Output Set: N:\CRF4\02272003\I645337A.raw

```

361          195          200          205
364 Ser Thr His Lys Thr Gly Asp Phe Phe Pro Gly Thr Gly His Ile Arg
365          210          215          220
368 Asp Val Gly Ala Glu Lys Gly Lys Tyr Tyr Ala Leu Asn Val Pro Leu
369 225          230          235          240
372 Asn Asp Gly Met Asp Asp Glu Ser Phe Arg Ser Leu Phe Arg Pro Leu
373          245          250          255
376 Ile Gln Lys Val Met Glu Val Tyr Gln Pro Glu Ala Val Val Leu Gln
377          260          265          270
380 Cys Gly Ala Asp Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn Leu
381          275          280          285
384 Ser Val Lys Gly His Ala Asp Cys Leu Arg Phe Leu Arg Ser Tyr Asn
385          290          295          300
388 Val Pro Leu Met Val Leu Gly Gly Glu Gly Tyr Thr Ile Arg Asn Val
389 305          310          315          320
392 Ala Arg Cys Trp Cys Tyr Glu Thr Ala Val Ala Val Gly Val Glu Pro
393          325          330          335
396 Asp Asn Lys Leu Pro Tyr Asn Glu Tyr Phe Glu Tyr Phe Gly Pro Asp
397          340          345          350
400 Tyr Thr Leu His Val Asp Pro Ser Pro Met Glu Asn Leu Asn Thr Pro
401          355          360          365
404 Lys Asp Met Glu Arg Ile Arg Asn Thr Leu Leu Glu Gln Leu Ser Gly
405          370          375          380
408 Leu Ile His Ala Pro Ser Val Gln Phe Gln His Thr Pro Pro Val Asn
409 385          390          395          400
412 Arg Val Leu Asp Glu Pro Glu Asp Asp Met Glu Thr Arg Pro Lys Pro
413          405          410          415
W--> 416 Arg Xaa Trp Ser Gly Thr Ala Thr Tyr Glu Ser Asp Ser Asp Asp Asp
417          420          425          430
420 Asp Lys Pro Leu His Gly Tyr Ser Cys Arg Gly Gly Ala Thr Thr Asp
421          435          440          445
424 Arg Asp Ser Thr Gly Glu Asp Glu Met Asp Asp Asp Asn Pro Glu Pro
425          450          455          460
428 Asp Val Asn Pro Pro Ser
429 465          470
432 <210> SEQ ID NO: 5
433 <211> LENGTH: 939
434 <212> TYPE: DNA
435 <213> ORGANISM: Arabidopsis thaliana
437 <400> SEQUENCE: 5
438 caccgcgtccg taaaaatcct ctctttttct caaccttgat tcttagccat ggagttctg 60
440 ggaattgaag ttaaatcagg aaagccagtt acagtgaact ctgaagaagg catcttate 120
442 caccgtttctc aggcctcgtc tggagaatgt aaaaacaaga agggagagtt tctgtcttta 180
444 catgtaaaag ttgggaacca gaacttgggt ctgggaactc tatcgactga gaacatccct 240
446 cagcttttct gqatittggt attcgapaag gqatittgagc ttctctcacac ttggggaaaa 300
448 ggaagtgttt actttgttgg atacaaaaact cccaacattg agccacaagg ctattctgag 360
450 gaagaagagg aagaagagga agaatgtact gttgggaatt ctgccaaagg ttttgtttta 420
452 gaaagaggtc agcttcgaga agtgaagaca gctgtgatac atgaagagga tgaattgat 480
454 tctgaaggaa tggatcagga tgaattctgat ggtgaggaat ctgaggaaga agagctaca 540

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003
TIME: 10:31:46

Input Seq : A:\104107.01.txt
Output Seq: N:\CRF4\02272003\I645337A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:3; N Pos. 1374
Seq#:4; Xaa Pos. 418

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/645,337A

DATE: 02/27/2003

TIME: 10:31:40

Input Set : A:\104107.01.txt

Output Set: N:\CRF4\02272003\I645337A.raw

L:132 M:41 W: (40) "n" or "Xna" used, for SEQ ID#:3 after pos.:1320
L:416 M:41 W: (40) "n" or "Xna" used, for SEQ ID#:4 after pos.:416